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Wang, Chen Edward, "Political Economy: The Role of a Profit-Maxamizing Government" (2012). *Wharton Research Scholars*. 117.
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Abstract

The recent onset of European sovereign debt crisis has once again raised awareness of the probability of a national default. While there are many factors that caused this crisis, it is commonly recognized that the corruption and inefficiency of the public sector had the most profound impact. By proposing a model where the primary goal of the government is to share the country's output and maximize its own profits, we can gain better insights into the interactions between the government and the countrymen. Why do people vote to change the ruling party of their country? Why do people even undertake revolution as a way to attempt to change the government? This paper aims to address these questions by setting forth a simple model that is inspired by the classical principal-agent problem.

Keywords

political economy, principle-agent problem, game theory

Disciplines

Business | Corporate Finance

Wharton Research Scholar Program
The Wharton School
University of Pennsylvania

April 20, 2012

Political Economy: The Role of A Profit-Maximizing Government

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ABSTRACT

The recent onset of European sovereign debt crisis has once again raised awareness of the probability of a national default. While there are many factors that caused this crisis, it is commonly recognized that the corruption and inefficiency of the public sector had the most profound impact. By proposing a model where the primary goal of the government is to share the country's output and maximize its own profits, we can gain better insights into the interactions between the government and the countrymen. Why do people vote to change the ruling party of their country? Why do people even undertake revolution as a way to attempt to change the government? This paper aims to address these questions by setting forth a simple model that is inspired by the classical principal-agent problem.

1. Introduction

The recent European sovereign debt crisis has prompted people to examine the long-term stability of financial and economic systems. As academics and practitioners probe the causes of this crisis, one problem that repeatedly shows up in analysis is the corruption and inefficiency of the public sector of the European countries, especially in Greece. For example, one would need to bribe a public official whenever he needs to get something done. One would not be able to build a house unless he bribes the official in charge of issuing building permits. In addition, nepotism plays a crucial role in the public sector. One could only be hired only if he has a connection within the government, and one would hire all his friends and family members once he is in a more senior position. Once hired in the government, it is almost impossible to fire someone and public employees could retire very early.

Furthermore, the tax system is very ineffective. The country could not collect as much tax as it hopes since people always try to avoid paying them. To make things worse, most of the major national companies evade national tax by either bribing the tax collector or register themselves in foreign countries. For instance, Greece has the biggest containership business in the world, but not much of the money stays in the country.

The country also has many ineffective systems. There are many monopolies in industries such as the logistics and the pharmaceuticals. As a result, there is no competition in these markets and only a small number of companies have controls. In the logistics industry in particular, the number of trucks which was needed in the 1980s when this system was created is of course not sufficient for the number demanded today. This means that the price of transporting goods in Greece is way too high. According to a local driver, apparently it is more expensive to transport a tomato 20 km away from the capital Athens than to import a tomato from Denmark.

With a deeply corrupted and inefficient public sector, the government is encroaching on the economic output of the country. Having this idea in mind, I conjecture that the government is in effect acting as profit-maximizer. The motivation behind this paper is that government is inefficient and one of its main objectives is to share a portion of the economic profits generated by the country it governs. In this paper, the people of a given country are treated as investors and the government as managers, with the country viewed as a company. With this assumption, I attempt to explain the different responses people might take given the government's effectiveness in running the country. We view the inefficiency/corruption of the government as a collective effort instead of merely the chief policy-makers.

2. The Model

The Government

There are 3 time periods, namely 0, 1, and 2. At time 0, a government is formed, and it has two choices when deciding the level of effort it wants to put into regulating the country and providing social benefits. There are only two choices for the government: either the high level of effort or the low level. For each level of effort, the government incurs an associated cost e^H or e^L , where $e^H > e^L$. Therefore, it is always more costly to engage in high effort activity than low effort activity from the government's point of view. At time 1, the government may or may not stay in power, and whether the government can stay in power or not at time 1 is explained in "*The People*" section.

If the government has the opportunity to stay in power again at time 1, then it needs to make another decision on the level of effort it wants to commit. After the government commits a level of effort at time 0 and possibly at time 1, depending on whether it could rule for another period, the country goes through

a state during which it is exposed to various macro-economic shocks. In this model we will just simply view these shocks collectively and distinguish the possible states into two categories: good and bad. The government has no way of knowing whether the nature of the state the country will go through ex-ante.

The level of effort the government puts into running the country, together with the nature of the state, jointly determine the economic output of the country at time 1 and 2. One way to interpret this output is utilizing the concept of the GDP. The payoff matrix of the country at the end of each period under different states and level of effort taken by the government is as follows:

Payoff	High Effort	Low Effort
Good State w.p. p_G	R_G^H	R_G^L
Bad State w.p. p_B	R_B^H	R_B^L

Once the economic output of the country is generated, the government then decides on the allocation of this output between the people and itself. For example, the government can keep all the economic output of the country to itself and leave nothing to the people. However, this extreme action will never take place given the constraints we will be imposing in the “*The Game*” section. The objective of the government is to maximize its share of the country’s economic output in either one or two periods.

The People

Assume all citizens of the country are homogeneous with initial endowment A . From the people’s perspective, they are happy with the government stay in power as long as it could deliver a rate of return γ , which can be either fixed or coming from a supply function $S(\gamma)$, at both time 1 and 2. The intuition for the fact that γ may or may not be a constant is that before time 0, people might have experienced

different economic conditions, which could have been good or bad. Given this prior experience, people might demand different rate of return on their assets for the next period. It is also noteworthy to point out that γ may not be positive, which could be counterintuitive at first glance. A profoundly impactful financial crisis such as the most recent one we just experienced will lower people's expectation of return on their current assets. However, these properties of γ are not significant in this model as they will not change the general conclusions.

There are two very important implications if the government cannot deliver the rate of return demanded by its people, γ , at either time 1 or 2, depending on how much the country's economic output falls short of people's demand. First, if people's share of the country's output is weakly in-between $\underline{\gamma}$ and γ , where $\underline{\gamma}$ is strictly less than γ , then people will cast a vote nationwide to change the government. As a result, the government has incentive to provide its people at least γA and rule for another period as long as their expected profit is higher by staying for two periods. Second, if people's share of the country's output is strictly less than $\underline{\gamma}$, which can be interpreted as the people's minimum subsistence level, then the people will have no choice but to start a revolution to overthrow the government. If this scenario were to happen at time 1, the government will suffer not only because it loses the opportunity to rule for another period and reap off the country's economic output in time 2 but also because it faces the possibility of losing a stable living environment. In the worst case, the lives of government leaders and public officials may be endangered. If the people start a revolution in order to change the government through brute force, then the government faces an extra cost D , which is strictly greater than $\underline{\gamma}A$. Hence, the government always has the incentive to pay at least $\underline{\gamma}A$ to its people to keep them away from colluding and starting a revolution. The assumption for the second scenario may be a little too strong, and the best way to think about it would be that the government is running the country is such a

horrendous way that the people are too impatient to wait to elect a new government to fix things; instead they decide to reshape the country in every aspect by themselves using military power. To summarize, people could start a revolution because of one of the following two situations: First, the government decides not to allocate $\underline{\gamma}A$ of the country's economic output to its people; Second, if the government decided to commit a low level of effort ruling the country and the country goes through a bad state, the output of the country R_B^L , is always less than $\underline{\gamma}A$. The people's objective is simple: give me a rate of return of γ .

The Game

For each period, the allocation of the country's economic output between the government and the people at the end of each period can be described by the following equation:

$$R_p + R_g = E[R(\theta, e)] \quad (1)$$

where R_p and R_g denote the allocations for the people and the government respectively. θ and e denote the nature of the state and the effort level respectively.

From expression (1) we could see that we need $R_p \geq \gamma A$ in order for people to continue voting for the existing government, otherwise the current government will be replaced by a new one through voting or military revolution. This implies that $R_g \leq E[R(\theta, e)] - \gamma A$.

The county's economic output is maximized if the government takes the high level of effort. Formally, this is:

$$p_G R_G^H + p_B R_B^H > p_G R_G^L + p_B R_B^L \quad (2)$$

However, the government does not have the incentive to take on the high level of effort because the expected profit after subtracting the amount needed to keep voters happy and its own cost is lower if it commits the high level of effort:

$$p_G R_G^H + p_B R_B^H - \gamma A - e^H < p_G R_G^L + p_B R_B^L - \gamma A - e^L \quad (3)$$

Cancelling γA on both sides:

$$p_G R_G^H + p_B R_B^H - e^H < p_G R_G^L + p_B R_B^L - e^L \quad (4)$$

This implies that it is better to take the low effort ex-ante for the government, without considering people's potential reactions such as voting and revolution.

Additionally, we are now imposing the constraints such that to the government high effort in good state is better than low effort in a good state and high effort is worse than low effort in a bad state.

Formally, this is:

$$\begin{aligned} R_G^H - \gamma A - e^H &> R_G^L - \gamma A - e^L \\ R_B^H - \gamma A - e^H &< R_B^L - \gamma A - e^L \end{aligned} \quad (5)$$

So now the government is facing a dilemma: if the government takes a high effort, then while a good state can ensure another term of ruling, a bad state would leave it to a lower profit; if the government takes a low effort, then a bad state would mean the government could earn higher profits, and a good state would mean that government is not gaining what it could have gained.

But the government also needs to take into consideration of the potential of ruling the country for a second term and the possibility of a revolution from the people in the case where it commits a low level of effort during a bad state.

Therefore, before the government decides on the level of effort it wants to commit, it needs to compare the expected returns from the following three strategies (high effort first then low effort):

1. Provide γA to the people whenever it could so that it could stay for one more term of ruling;

$$p_G\{(R_G^H - e^H - \gamma A) + E^*[R(\theta, e^L)]\} + p_B\{(R_B^H - e^H) + E^*[R(\theta, e^L)]\}$$

$$p_G\{(R_G^L - e^L - \gamma A) + E^*[R(\theta, e^L)]\} + p_B\{(R_B^L - e^L) + E^*[R(\theta, e^L)]\}$$

Where

$$E^*[R(\theta, e^L)] = p_G(R_G^L - e^L - \underline{\gamma}A) + p_B(R_B^L - e^L - D)$$

2. Provide $\underline{\gamma}A$ to the people to prevent people from starting a revolution and avoid the cost of D ;

$$p_G\{(R_G^H - e^H - \underline{\gamma}A)\} + p_B\{(R_B^H - e^H - \underline{\gamma}A)\}$$

$$p_G\{(R_G^L - e^L - \underline{\gamma}A)\} + p_B\{(R_B^L - e^L - D)\}$$

3. Keep all the economic output of the country and is willing to bear the cost D ;

$$p_G\{(R_G^H - e^H - D)\} + p_B\{(R_B^H - e^H - D)\}$$

$$p_G\{(R_G^L - e^L - D)\} + p_B\{(R_B^L - e^L - D)\}$$

The reason why the government always takes the low effort action in its second period of ruling in strategy 1 is because the government can reap off more profits by taking the low effort action. Since $\underline{\gamma}A < D$, we have:

$$p_G(R_G^H - \underline{\gamma}A - e^H) + p_B(R_B^H - \underline{\gamma}A - e^H) < p_G(R_G^L - \underline{\gamma}A - e^L) + p_B(R_B^L - D - e^L) \quad (6)$$

Now we impose the constraint that the expected return for each level of effort is in descending order with the return from strategy 1 being the highest, strategy 2 second, and strategy 3 the least. In this way

the government always has the incentive to try to stay for a second term, during which it will take a low effort, to maximize its share of the country's output.

The Equilibrium

The government will be indifferent when the expected return from taking the high level of effort is equal to that of taking the low level of effort. We can write the expression as follows:

$$\begin{aligned} & p_G\{(R_G^L - e^L - \gamma A) + E^*[R(\theta, e^L)]\} + p_B(R_B^L - e^L - D) \\ &= p_G\{(R_G^H - e^H - \gamma A) + E^*[R(\theta, e^L)]\} + p_B\{(R_B^H - e^H - \gamma A) + E^*[R(\theta, e^L)]\} \end{aligned} \quad (7)$$

Hence we have:

$$\begin{aligned} & p_G \left[(R_G^L - e^L - \gamma A) + p_G (R_G^L - e^L - \underline{\gamma} A) + p_B (R_B^L - e^L - D) \right] + p_B (R_B^L - e^L - D) \\ &= p_G \left[(R_G^H - e^H - \gamma A) + p_G (R_G^L - e^L - \underline{\gamma} A) + p_B (R_B^L - e^L - D) \right] \\ &+ p_B [(R_B^H - e^H - \gamma A) + p_G (R_G^L - e^L - \underline{\gamma} A) + p_B (R_B^L - e^L - D)] \end{aligned} \quad (8)$$

Cancelling terms on both sides of the equation:

$$\begin{aligned} & p_G [(R_G^L - e^L - \gamma A)] + p_B (R_B^L - e^L - D) \\ &= p_G [(R_G^H - e^H - \gamma A)] + p_B [(R_B^H - e^H - \gamma A) + p_G (R_G^L - e^L - \underline{\gamma} A) + p_B (R_B^L - e^L - D)] \end{aligned}$$

Further cancellation of terms:

$$\begin{aligned} & p_G R_G^L - p_G \gamma A + p_B R_B^L - p_B D - e^L \\ &= p_G R_G^H - e^H - \gamma A + p_B R_B^H + p_B p_G (R_G^L - e^L - \underline{\gamma} A) + p_B^2 (R_B^L - e^L - D) \end{aligned}$$

Rearranging the terms:

$$(p_G - p_B p_G)R_G^L + (p_B p_G + p_B^2 - 1)e^L + (p_B - p_B^2)R_B^L + (p_B^2 - p_B)D - p_G R_G^H - p_B R_B^H + (1 - p_G \gamma + p_B p_G \gamma)A + e^H = 0 \quad (9)$$

From expression (9) we could perform a careful examination of the different parameters and see how each of them influences the behavior of the government at the equilibrium.

R_G^L : Since $p_G - p_B p_G$ is positive, a higher R_G^L would encourage the government to take a low effort.

R_B^L : Since $p_B - p_B^2$ is positive, a higher R_B^L would encourage the government to take a low effort.

R_G^H : Since $-p_G$ is negative, a higher R_G^H would encourage the government to take a high effort.

R_B^H : Since $-p_B$ is negative, a higher R_B^H would encourage the government to take a high effort.

e^L : Since $p_B p_G + p_B^2 - 1$ is negative, a higher e^L would encourage the government to take a high effort.

e^H : Since 1 is positive, a higher e^H would encourage the government to take a low effort.

D : Since $p_B^2 - p_B$ is negative, a higher D would encourage the government to take a high effort.

A : Since $1 - p_G \gamma + p_B p_G \gamma$ is positive, a higher A would encourage the government to take a low effort.

The implications above are intuitive. First, the government always has the incentive to choose the level of effort that will yield a higher return and a lower cost. Second, if the cost D is significantly high, then the government will try to prevent the people from starting a revolution by always taking the high

level of effort. Third, if people's initial assets are high, then it is more likely that people will live below the basic subsistence level even though there could be a bad state and the government is not working hard. Hence the chance of a revolution is smaller and the government chooses the low effort level.

3. Conclusion

By setting forth a model in which the government acts as profit-maximizer and the people of the country acting as investors, we can gain a better insight into how people attempt to change governments through either election or an extreme form of protest – revolution. The government has the incentive to initially deliver the rate of return demanded by its people in its first term of ruling, but is only willing to keep the people at their basic subsistence level of living during the second period to extract the maximum profits from its citizens. This model attempts to explain some of the basic motivations behind government-people interactions, and it is acknowledged that further refinement might be needed to develop a more comprehensive model.